°FORM PTO-1390 (REV 11-2000) U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. § 371

ATTORNEY'S DOCKET NUMBER: 449122022500

U S APPLICATION NO (If known, see 37 CFR 1 5): 10/048014 Not yet assigned

INTERNATIONAL APPLICATION NO	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/DE00/02521	July 31, 2000	July 29,1999

TITLE OF INVENTION

METHOD OF DETERMINING CELL LOSS PRIORITY INFORMATION

APPLICANT(S) FOR DO/EO/US

Herbert HEISS

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below
4. ☒ The US has been elected by the expiration of 19 months from the priority date (PCT Article 31).
5. ☒ A copy of the International Application as filed (35 U S.C. 371(c)(2))
   a. ☒ is attached hereto (required only if not communicated by the International Bureau)
   b. ☒ has been communicated by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☐ An English language translation of the International Application under PCT Article 19 (35 U S C 371(c)(2)).
   a. ☐ is attached hereto.
   b. ☐ has been previously submitted under 35 U S.C 154(d)(4)
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
   a. ☐ are attached hereto (required only if not communicated by the International Bureau).
   b. ☐ have been communicated by the International Bureau
   c. ☐ have not been made, however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U S.C 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U S C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1 98
12. ☐ An assignment document for recording A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment
14. ☐ A SECOND or SUBSEQUENT preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S C. 1.821 - 1 825
18. ☐ A second copy of the published international application under 35 U S C 154(d)(4)
19. ☐ A second copy of the English language translation of the international application under 35 U S C 154(d)(4)
20. ☒ Other items or information 1) Application Data Sheet; 2)Int'l Search Report; 3) IPER; 4) Return receipt postcard.

CERTIFICATE OF HAND DELIVERY

I hereby certify that this correspondence is being hand filed with the United States Patent and Trademark Office in Washington, D.C. on January 28, 2002.

Melissa Garton

Melissa Garton

dc-296932

U.S. APPLICATION NO (if known, see 37 CFR 1 5)	INTERNATIONAL APPLICATION NO	ATTORNEY DOCKET NO
Not yet assigned 10/048014	PCT/DE00/02521	449122022500

21. ☒ The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)):

Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO.....$1,000.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO.....$890.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO.....$710.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provision of PCT Article 33(1)-(4) $690.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) $100.00

	CALCULATIONS PTO USE ONLY	
ENTER APPROPRIATE BASIC FEE AMOUNT =	$890.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$0	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	- 20 =		x $18.00	$0	
Independent claims	- 3 =		x $80.00	$0	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ $270.00	$0	

TOTAL OF ABOVE CALCULATIONS =	$890.00	
☐ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by ½.	$0	
SUBTOTAL =	$890.00	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)). +	$0	
TOTAL NATIONAL FEE =	$890.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00 per property** +	$0	
TOTAL FEES ENCLOSED =	$890.00	
	Amount to be refunded:	**$**
	charged:	**$**

a. ☒ Please charge my **Deposit Account No. 03-1952** (referencing Docket No. 449122022500) in the amount of $890.00 to cover the above fees. A duplicate copy of this sheet is enclosed.

b. ☒ The Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment to **Deposit Account No. 03-1952** (referencing Docket No. 449122022500).

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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SIGNATURE

Kevin R. Spivak
Registration No. 43,148

January 28, 2002

PATENT
Docket No. 449122022500

CERTIFICATE OF HAND DELIVERY

I hereby certify that this correspondence is being hand filed with the United States Patent and Trademark Office in Washington, D.C. on June 10, 2002.

Nancy DeRiggi

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Herbert HEISS

Serial No.: 10/048,014

Filing Date: To be Determined

For: PROCEDURE TO DETERMINE CELL LOSS PRIORITY INFORMATION

Examiner: not yet assigned

Group Art Unit: not yet assigned

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination and calculation of the fees, please amend this application as follows.

AMENDMENTS

In the Claims:

1. (Amended) A method to determine cell lost priority information in operation administration maintenance cells and resource management cells, comprising:

inserting the administration maintenance and resource management cells between cells of a virtual link with a guaranteed frame rate within an ATM communications system and/or ATM communications terminal equipment; and

determining the cell lost priority information of the cell to be transmitted directly of the respective virtual link, and inserting the cell lost priority information into the operation administration maintenance and/or resource management cells as current cell lost priority information.

2. (Amended) The method according to claim 1, wherein the cell lost priority information of the respective cell can be assigned different loss priorities.

3. (Amended) The method according to claim 1, wherein the cell lost priority information comprises a one- bit piece of information.

4. (Amended) The method according to claim 1, wherein the operation administration maintenance and resource management cells are structured as operation administration maintenance and resource management cells according to standard ITU-T I.610 and ITU-T I.371.

5. (Amended) The method according to claim 1, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

6. (Amended) The method according to claim 1, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the

operation, maintenance, administration and/or resource management cell as current cell loss priority information.

7. (New) The method according to claim 2, wherein the cell lost priority information comprises a one- bit piece of information.

8. (New) The method according to claim 2, wherein the operation administration maintenance and resource management cells are structured as operation administration maintenance and resource management cells according to standard ITU-T I.610 and ITU-T I.371.

9. (New) The method according to claim 3, wherein the operation administration maintenance and resource management cells are structured as operation administration maintenance and resource management cells according to standard ITU-T I.610 and ITU-T I.371.

10. (New) The method according to claim 1, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

11. (New) The method according to claim 2, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

12. (New) The method according to claim 3, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

13. (New) The method according to claim 4, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

14. (New) The method according to claim 2, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

15. (New) The method according to claim 3, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

16. (New) The method according to claim 4, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

17. (New) The method according to claim 5, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

REMARKS

Amendments to the specification have been made and are submitted herewith in the attached Substitute Specification. A clean copy of the specification and a marked-up version showing the changes made are attached herewith. The claims and abstract have been amended in the attached Preliminary Amendment. All amendments have been made to place the application in proper U.S. format and to conform with proper grammatical and idiomatic English. None of the amendments herein are made for reasons related to patentability. No new matter has been added.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**".

In the event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. 449122022500.

Respectfully submitted,

Dated: June 10, 2002

By: _____
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

1. (Amended) ~~Procedure~~ A method to determine cell lost priority information ~~(CLP)~~ in operation administration maintenance ~~(OAM)~~ cells and resource management cells ~~that are inserted between cells (DP1, DP2) of a virtual link (GFR-Vx) with~~ , comprising:

inserting the administration maintenance and resource management cells between cells of a virtual link with a guaranteed frame rate within an ATM communications system and/or ATM communications terminal equipment; and~~,~~

~~in which~~ determining the cell lost priority information ~~(CLP)~~ of the cell ~~(DP1)~~ to be transmitted directly of the respective virtual link~~(GFR-Vx) is determined and inserted~~, and inserting the cell lost priority information into the operation administration maintenance and/or resource management cells ~~(OAM)~~ as current cell lost priority information~~(CLP)~~.

2. (Amended) ~~Procedure~~ The method according to ~~Claim~~ claim 1, wherein the cell lost priority information ~~(CLP)~~ of the respective cell ~~(DPx)~~ can be assigned different loss priorities.

3. (Amended) ~~Procedure~~ The method according to ~~Claim 1 or 2~~ claim 1, wherein the cell lost priority information ~~(CLP)~~ comprises a one- bit piece of information.

4. (Amended) ~~Procedure~~ The method according to ~~one of Claims 1 through 3~~ claim 1, wherein the operation administration maintenance and resource management cells ~~(OAM)~~ are structured as operation administration maintenance and resource management cells according to standard ITU-T I.610 and ITU-T I.371.

5. (Amended) ~~Procedure~~ The method according to ~~one of Claims 1 through 4~~ claim 1, wherein ~~that~~ in the absence of a cell to be transmitted directly~~(DP1)~~, the virtual link ~~(GFR-Vx)~~ inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell ~~(OAM)~~ as current cell loss priority information~~(CLP).~~.

6. (Amended) ~~Procedure according to one of Claims 1 through 5 wherein after the transmission of the last cell (DPx) of a frame in a virtual link during the insertion of an~~ The method according to claim 1, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell ~~(OAM), the cell loss priority information (CLP) of the cell to be transmitted directly in the following frame of the virtual link (GFR-Vx) is determined and inserted into the operation, maintenance, administration and/or resource management cell (OAM~~ as current cell loss priority information~~(CLP).~~.

7.(New) The method according to claim 2, wherein the cell lost priority information comprises a one- bit piece of information.

8.(New) The method according to claim 2, wherein the operation administration maintenance and resource management cells are structured as operation administration maintenance and resource management cells according to standard ITU-T I.610 and ITU-T I.371.

9. (New) The method according to claim 3, wherein the operation administration maintenance and resource management cells are structured as operation administration maintenance and resource management cells according to standard ITU-T I.610 and ITU-T I.371.

10. (New) The method according to claim 1, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

11. (New) The method according to claim 2, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

12. (New) The method according to claim 3, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

13. (New) The method according to claim 4, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

14. (New) The method according to claim 2, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

15. (New) The method according to claim 3, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

16. (New) The method according to claim 4, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

17. (New) The method according to claim 5, wherein in the absence of a cell to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information.

Substitute Specification
(Clean Copy)

PROCEDURE TO DETERMINE CELL LOSS PRIORITY INFORMATION

CLAIM FOR PRIORITY

This is a U.S. national stage of PCT/DE00/02521 filed July 31, 2000 which claims priority to German application 19935787.0 and 19937244.6 filed July 29, 1999 and August 6, 1999, respectively.

TECHNICAL FIELD OF THE INVENTION

A method to determine cell lost priority information in operation administration maintenance cells and resource management cells.

BACKGROUND OF THE INVENTION

Existing and future packet-oriented communications networks, for example ATM (asynchronous transfer mode) communications networks, provide a variety of monitoring strategies to monitor variable and fixed and guaranteed transfer rates of ATM cells and ATM cells belonging to a framework or transfer framework. In particular, in the case of ATM communications networks, loss priorities are assigned to transmitting ATM cells and, based on the loss priorities and based on loss priorities decisions, are made concerning the retransfer of the respective ATM cells in a communication system. In this connection, a monitoring procedure is used to decide on the retransfer or rejection of an ATM cell to the respective communications system based on the assigned loss priorities. In this way, assigning loss priorities to individual cells establishes which ATM cells can be discarded in the event of overload within an ATM communication system without the loss of real time information that is relevant to the connection.

Also, the "Traffic Management 4.1" proposal of the 1999 ATM Forum defines various traffic classes and connection types. These include constant bit rate (CBR) connections, variable bit rate (VBR) connections, available bit rate (ABR) connections, unspecified bit rate (UBR) connections and guaranteed frame rate (GFR) connections.

The constant bit rate connection type is used for virtual links, for which a given constant transmission bandwidth must be provided for the time in which a virtual link exists.

The variable bit rate connection type is defined for virtual links with variable and/or changeable transmission rate requirements in the "Traffic Management 4.1" of the 1999 ATM Forum proposal.

The available bit rate connection type makes possible applications that do not have assigned a specific transmission bandwidth. The applications can use the currently possible transmission bandwidths within the ATM communication network, whereby the respective available bit rate connection must be assigned a maximum and a minimum transmission rate in each case and is not allowed to go above or fall below these limits.

The unspecified bit rate connection type is not assigned any fixed cell loss information or cell delay times of the respective virtual connection. Instead, the unspecified bit rate connection type represents a best effort service class comparable to the type of service class that in practice is provided for Internet applications.

The guaranteed frame rate connection type is provided to support delay-tolerant applications that are guaranteed a narrow transmission bandwidth and which can be granted additional transmission capacity freed up during data traffic. In a guaranteed frame rate connection type, a frame's information is packed into ATM cells and all ATM cells of a given frame are assigned the same loss priority or cell loss priority information using cell loss priority bits (CLP bits), i.e., the header of the ATM cells assumes the same value of the CLP bit used to control overload in ATM communications systems as for the ATM cells of a frame of a virtual guaranteed frame rate connection.

If, for example, a network node or an ATM communications system are overloaded, it could result in all of the ATM cells belonging to the network node or an ATM communications system being discarded. Experts in the field know of a number of different anti-overload strategies, such as frame discard, see the 1999 ATM Forum "Traffic Management 4.1" proposal. The above can avoid that additional ATM cells of the frame are transmitted via the provided transmission after loss or reception of a faulty ATM cell, although the frame information would not be received error-free at the end of the transmission line. The above would result in an unnecessary load on the ATM communications system. That is why in the event of an overloaded transmission line, it is especially important to remove the additional ATM cells of a frame as quickly and effectively as possible. If the ATM cells of a frame show different loss priorities, this frame will not support a quality of service, i.e., if an overload situation occurs some or all of the frame's ATM

cells can be discarded in the network node or in the ATM communications system.

We also know ITU-T standards I.610 and I.371 provided solely for the operation, maintenance and administration and also resource management of ATM cells and control cells within the ATM communications system. Such ATM cells are called operation administration maintenance (OAM) cells and resource management cells, respectively. These can be inserted into the continuous ATM cell stream by ATM communications transmitters and an ATM communications system. When inserting OAM cells or RM cells into the cell stream, it is especially important to ensure the quality of service for the frames to be sent.

SUMMARY OF THE INVENTION

The invention is to ensures the quality of service when inserting operation administration maintenance cells and resource management cells.

In one embodiment of the invention, in order to determine cell loss priority information in operation, maintenance, administration and/or resource management cells that are inserted between virtually linked cells with guaranteed frame rate within an ATM communications system and/or an ATM communications system, cell loss priority information of the cell to be sent directly of the relevant virtual connection is determined and inserted into the operation, maintenance, administration and/or resource management cell as current cell loss priority information. Consequently, all ATM cells, including the inserted operation, maintenance, administration and/or resource management cells, include the same cell loss priority information and the quality of service is ensured for

each frame in an advantageous manner and/or the discarding of a complete frame and/or single ATM cells of a frame due to the insertion of operation, maintenance, administration and/or resource management cells with different cell loss priority information is avoided. Using the procedure according to the invention, existing monitoring algorithms can be advantageously continue to be used because as a rule the operation, maintenance, administration and/or resource management cells inserted into the cell stream for the overload control of a network node and/or an ATM communications system do not have to be treated differently.

According to an additional embodiment of the invention, the respective cells are assigned different loss priorities by the cell loss priority information and the cell loss priority information is created by a one-bit piece of information. The allocation of different loss priorities using the cell loss priority information and creating a one bit piece of information is coordinated with the "Traffic Management 4.1" proposal of the 1999 ATM Forum.

According to another embodiment of invention, the operation, maintenance, administration and/or resource management cells take the form of operation administration maintenance (OAM) cells and resource management (RM) cells according to standard ITU-T I.160 and ITU-T I.371.

In still another embodiment of the invention, in the absence of a cell of the virtual connection to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the

operation, maintenance, administration and/or resource management cell as current cell loss priority information. On this point, advantageously, the standard cell loss priority information represented by the CLP bit assumes the logical value "0", i.e., that there is a low probability - due to the standard "0" assigned to the CLP bits in the ATM cells - that these ATM cells will be discarded in the event of an overload situation, for example, within an ATM communications system.

According to another embodiment of the invention, after the transmission of the last cell of a frame in a virtual link during the insertion of an operation, maintenance, administration and/or resource management cell, the cell loss priority information of the cell to be sent directly in the following frame of the virtual link is determined and inserted into the operation, maintenance, administration and/or resource management cell as current cell loss priority information. Advantageously, the operation, maintenance, administration and/or resource management cell inserted after the sending of the last cell will be transmitted together with the cells of the following frame.

BRIEF DESCRIPTION OF THE DRAWINGS

The procedure according to the invention is explained below, in which:

Figure 1 illustrates a block diagram of an ATM communications system using an asynchronous transfer mode.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Figure 1 illustrates a block diagram of an ATM communications system ATM-KE using an asynchronous transfer mode, in which a majority of feeder lines E1 through En and a majority of customer lines A1 through An are connected using service units AE. Of the above, for example, feeder lines E1 through En and customer lines A1 through An and one of several possible service units AE are represented. Via the feeder lines E1 through En and customer lines A1 through An, ATM cells DPx are transmitted via virtual links using asynchronous transfer mode, whereby variable, fixed or guaranteed transfer rates are provided for the transmittal of the ATM cells DPx via the virtual links. In the block diagram, a virtual GFR connection GFR-Vx is represented by a broken line and its feeder line Ex and/or its customer line Ax. In a guaranteed frame rate (GFR) link, a frame's information is packed in ATM cells and ATM cells DPx of a frame are assigned the same loss priority and/or cell loss priority information CLP using cell loss priority bits (CLP-Bit).

The service unit AE includes a number of processing devices BHE, whereby each of the feeder lines E1 through En and the customer lines A1 through An is assigned to a processing device BHE.

To illustrate the procedure according to the invention, Figure 1 shows, for example, the feeder-processing device BHEE assigned to the virtual GFR link GFR-Vx, which is connected to the feeder network Ex. The ATM cells DPx sent in the virtual GFR link GFR-Vx are transmitted to the feeder-processing device BHEE of service unit AE. Then the ATM cells DPx of the virtual GFR link GFR-Vx are sent to the switching network KA of the ATM

communications system ATM-KE, whereby a multi-level structure of interconnected switching matrices KV is shown in Figure 1, as an example, for switching network KA. However, other single- or multi-stage switching networks can be provided. Then the ATM cells DPx of the virtual GFR link GFR-Vx is relayed by switching network KA to the customer line AX by a processing device BHE connected to the customer lines A1 through An.

The processing devices BHE/BHEE are supplied with a storage unit PS and a micro controller MC, whereby, for example, the storage unit PS and the microcontroller MC of the feeder processing device BHEE of the virtual GFR link GFR-Vx is represented in Figure 1. When an ATM cell DPx of a frame of the virtual GFR link GFR-Vx arrives at the ATM communications system ATM-KE, the ATM cell DPx is forwarded to the feeder processing device BHEE of the service unit AE where it is temporarily stored in storage unit PS. Figure 1 shows an example of a first and second ATM cell DP1, DP2 of the virtual GFR link GFR-Vx temporarily stored in the storage unit PS, whereby the first ATM cell DP1 was temporarily stored in the storage unit PS and is therefore provided for direct transmission to the switching network KA. If the insertion of an OAM or RM cell OAM into the cell stream of the virtual GFR link GFR-Vx is provided by the ATM communications system ATM-KE, it is assumed that there is one OAM and/or RM cell OAM in the ATM communications system ATM-KE and/or in the feeder-processing device BHEE of the service unit AE. Further, the cell loss priority information CLP transmitted in the temporarily stored first ATM cell DP1 from the next ATM cell DPX to be sent to the virtual GFR link GFR-Vx is read and/or copied using the microcontroller MC as part of a reading cycle and

inserted into the created OAM and/or RM cell OAM and temporarily stored in the storage unit PS. Figure 1 shows an example of an OAM cell AOM in which using the microcontroller MC, the cell loss priority information CLP of the temporarily stored first ATM cell DP1 is entered and/or copied. The modified OAM and/or RM cell OAM is then inserted in the cell stream of the virtual GFR link GFR-Vx, for example, as shown in Figure 1, between the first and second, temporarily stored ATM cell DP1, DP2. If there is no ATM cell DP1, DP2 of the GFR link GFR-Vx temporarily stored in the storage unit and/or if the last ATM cell DP1,DP2 of the frame of the virtual GFR link GFR-Vx was already sent, the OAM and/or RM cell OAM to be inserted will be given the logical value "0" standard cell loss priority information and inserted and/or copied. After transmitting the first ATM cell DP1, the inserted OAM cell OAM will be sent to the network KA and switched.

The respective ATM cell DPx and/or the inserted OAM and/or RM cell OAM will be sent to the processing device BHE connected to the consumer line Ax and forwarded to the consumer line Ax by the processing device BHE.

Substitute Specification
(Marked Copy)

~~DESCRIPTION~~

PROCEDURE TO DETERMINE CELL LOSS PRIORITY INFORMATION

CLAIM FOR PRIORITY

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communication system without the loss of real time information that is relevant to the connection.

Also, the "Traffic Management 4.1" proposal of the 1999 ATM Forum defines various traffic classes and connection types. These include constant bit rate (CBR) connections, variable bit rate (VBR) connections, available bit rate (ABR) connections, unspecified bit rate (UBR) connections and guaranteed frame rate (GFR) connections.

The constant bit rate connection type is used for virtual links, for which a given constant transmission bandwidth must be provided for the time in which a virtual link exists.

The variable bit rate connection type is defined for virtual links with variable and/or changeable transmission rate requirements in the "Traffic Management 4.1" of the 1999 ATM Forum proposal.

The available bit rate connection type makes possible applications that do not have assigned a specific transmission bandwidth. The applications can use the currently possible transmission bandwidths within the ATM communication network, whereby the respective available bit rate connection must be assigned a maximum and a minimum transmission rate in each case and is not allowed to go above or fall below these limits.

The unspecified bit rate connection type is not assigned any fixed cell loss information or cell delay times of the respective virtual connection. Instead, the unspecified bit rate connection type represents a best effort service class comparable to the type of service

class that in practice is provided for Internet applications.

The guaranteed frame rate connection type is provided to support delay-tolerant applications that are guaranteed a narrow transmission bandwidth and which can be granted additional transmission capacity freed up during data traffic. In a guaranteed frame rate connection type, a frame's information is packed into ATM cells and all ATM cells of a given frame are assigned the same loss priority or cell loss priority information using cell loss priority bits (CLP bits), i.e., the header of the ATM cells assumes the same value of the CLP bit used to control overload in ATM communications systems as for the ATM cells of a frame of a virtual guaranteed frame rate connection.

If, for example, a network node or an ATM communications system are overloaded, it could result in all of the ATM cells belonging to the network node or an ATM communications system being discarded. Experts in the field know of a number of different anti-overload strategies, such as frame discard, see the 1999 ATM Forum "Traffic Management 4.1" proposal. The above can avoid that additional ATM cells of the frame are transmitted via the provided transmission after loss or reception of a faulty ATM cell, although the frame information would not be received error-free at the end of the transmission line. The above would result in an unnecessary load on the ATM communications system. That is why in the event of an overloaded transmission line, it is especially important to remove the additional ATM cells of a frame as quickly and effectively as possible. If the ATM cells of a frame show different loss priorities, this frame

will not support a quality of service, i.e., if an overload situation occurs some or all of the frame's ATM cells can be discarded in the network node or in the ATM communications system.

We also know ITU-T standards I.610 and I.371 provided solely for the operation, maintenance and administration and also resource management of ATM cells and control cells within the ATM communications system. Such ATM cells are called operation administration maintenance (OAM) cells and resource management cells, respectively. These can be inserted into the continuous ATM cell stream by ATM communications transmitters and an ATM communications system. When inserting OAM cells or RM cells into the cell
stream, it is especially important to ensure the quality of service for the frames to be sent.

SUMMARY OF THE INVENTION

The invention is to ensures ~~The underlying task of the invention is to ensure~~ the quality of service when inserting operation administration maintenance cells and resource management cells.

~~The task is accomplished by the features of Claim 1.~~

~~The essential aspect of the procedure according to the invention is as follows:~~ **In one embodiment of the invention,** in order to determine cell loss priority information in operation, maintenance, administration and/or resource management cells that are inserted between virtually linked cells with guaranteed frame rate within an ATM communications system and/or an ATM communications system, cell loss priority information of

the cell to be sent directly of the relevant virtual connection is determined and inserted into the operation, maintenance, administration and/or resource management cell as current cell loss priority information. Consequently, all ATM cells, including the inserted operation, maintenance, administration and/or resource management cells, ~~contain~~ **include** the same cell loss priority information and the quality of service is ensured for each frame in an advantageous manner and/or the discarding of a complete frame and/or single ATM cells of a frame due to the insertion of operation, maintenance, administration and/or resource management cells with different cell loss priority information is avoided. Using the procedure according to the invention, existing monitoring algorithms can be advantageously continue to be used because as a rule the operation, maintenance, administration and/or resource management cells inserted into the cell stream for the overload control of a network node and/or an ATM communications system do not have to be treated differently.

According to an additional embodiment of the ~~procedure according to the~~ invention, the respective cells are assigned different loss priorities by the cell loss priority information ~~Claim 2~~ and the cell loss priority information is created by a one-bit piece of information ~~Claim 3~~. The allocation of different loss priorities using the cell loss priority information and creating a one bit piece of information is coordinated with the "Traffic Management 4.1" proposal of the 1999 ATM Forum.

According to another embodiment of ~~the procedure according to the~~ invention, the operation, maintenance,

administration and/or resource management cells take the form of operation administration maintenance (OAM) cells and resource management (RM) cells according to standard ITU-T I.160 and ITU-T I.371~~ Claim 4.~~.

~~An additional significant advantage of the procedure according to the invention consists in the fact that~~ **In still another embodiment of the invention,** in the absence of a cell of the virtual connection to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information~~ Claim 5~~. On this point, advantageously, the standard cell loss priority information represented by the CLP bit assumes the logical value "0", i.e., that there is a low probability - due to the standard "0" assigned to the CLP bits in the ATM cells - that these ATM cells will be discarded in the event of an overload situation, for example, within an ATM communications system.

According to another embodiment of the ~~procedure according to the~~ invention, after the transmission of the last cell of a frame in a virtual link during the insertion of an operation, maintenance, administration and/or resource management cell, the cell loss priority information of the cell to be sent directly in the following frame of the virtual link is determined and inserted into the operation, maintenance, administration and/or resource management cell as current cell loss priority information~~ Claim 6~~. Advantageously, the operation, maintenance, administration and/or resource management cell inserted after the sending of the last

cell will be transmitted together with the cells of the following frame.

BRIEF DESCRIPTION OF THE DRAWINGS

The procedure according to the invention is explained below ~~using a block diagram.~~**, in which:**

~~The Figure 1 block diagram is a schematic representation~~ **Figure 1 illustrates a block diagram of an ATM communications system using an asynchronous transfer mode.**

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Figure 1 illustrates a block diagram of an ATM communications system ATM-KE using an asynchronous transfer mode, in which a majority of feeder lines E1 through En and a majority of customer lines A1 through An are connected using service units AE. Of the above, for example, feeder lines E1 through En and customer lines A1 through An and one of several possible service units AE are represented. Via the feeder lines E1 through En and customer lines A1 through An, ATM cells DPx are transmitted via virtual links using asynchronous transfer mode, whereby variable, fixed or guaranteed transfer rates are provided for the transmittal of the ATM cells DPx via the virtual links. In the block diagram, a virtual GFR connection GFR-Vx is represented by a broken line and its feeder line Ex and/or its customer line Ax. In a guaranteed frame rate (GFR) link ~~all of~~, a frame's information is packed in ATM cells and ~~all~~ ATM cells DPx of a frame are assigned the same loss priority and/or cell loss priority information CLP using cell loss priority bits (CLP-Bit).

The service unit AE ~~contains~~ **includes** a number of processing devices BHE, whereby each of the feeder lines E1 through En and the customer lines A1 through An is assigned to a processing device BHE.

To illustrate the procedure according to the invention, Figure 1 shows, for example, the feeder-processing device BHEE assigned to the virtual GFR link GFR-Vx, which is connected to the feeder network Ex. The ATM cells DPx sent in the virtual GFR link GFR-Vx are transmitted to the feeder-processing device BHEE of service unit AE. Then the ATM cells DPx of the virtual GFR link GFR-Vx are sent to the switching network KA of the ATM communications system ATM-KE, whereby a multi-level structure of interconnected switching matrices KV is shown in Figure 1, as an example, for switching network KA. However, other single- or multi-stage switching networks can be provided. Then the ATM cells DPx of the virtual GFR link GFR-Vx is relayed by switching network KA to the customer line AX by a processing device BHE connected to the customer lines A1 through An.

The processing devices BHE/BHEE are supplied with a storage unit PS and a micro controller MC, whereby, for example, the storage unit PS and the microcontroller MC of the feeder processing device BHEE of the virtual GFR link GFR-Vx is represented in Figure 1. When an ATM cell DPx of a frame of the virtual GFR link GFR-Vx arrives at the ATM communications system ATM-KE, the ATM cell DPx is forwarded to the feeder processing device BHEE of the service unit AE where it is temporarily stored in storage unit PS. Figure 1 shows an example of a first and second ATM cell DP1, DP2 of the virtual GFR link GFR-Vx temporarily stored in the storage unit PS, whereby the

first ATM cell DP1 was temporarily stored in the storage unit PS and is therefore provided for direct transmission to the switching network KA. If the insertion of an OAM or RM cell OAM into the cell stream of the virtual GFR link GFR-Vx is provided by the ATM communications system ATM-KE, it is assumed that there is one OAM and/or RM cell OAM in the ATM communications system ATM-KE and/or in the feeder-processing device BHEE of the service unit AE. Further, the cell loss priority information CLP transmitted in the temporarily stored first ATM cell DP1 from the next ATM cell DPX to be sent to the virtual GFR link GFR-Vx is read and/or copied using the microcontroller MC as part of a reading cycle and inserted into the created OAM and/or RM cell OAM and temporarily stored in the storage unit PS. Figure 1 shows an example of an OAM cell AOM in which using the microcontroller MC, the cell loss priority information CLP of the temporarily stored first ATM cell DP1 is entered and/or copied. The modified OAM and/or RM cell OAM is then inserted in the cell stream of the virtual GFR link GFR-Vx, for example, as shown in Figure 1, between the first and second, temporarily stored ATM cell DP1, DP2. If there is no ATM cell DP1, DP2 of the GFR link GFR-Vx temporarily stored in the storage unit and/or if the last ATM cell DP1,DP2 of the frame of the virtual GFR link GFR-Vx was already sent, the OAM and/or RM cell OAM to be inserted will be given the logical value "0" standard cell loss priority information and inserted and/or copied. After transmitting the first ATM cell DP1, the inserted OAM cell OAM will be sent to the network KA and switched.

The respective ATM cell DPx and/or the inserted OAM and/or RM cell OAM will be sent to the processing device

BHE connected to the consumer line Ax and forwarded to the consumer line Ax by the processing device BHE.

Description

Procedure to determine cell loss priority information

Existing and future packet-oriented communications networks, for example ATM (asynchronous transfer mode) communications networks, provide a variety of monitoring strategies to monitor variable and fixed and guaranteed transfer rates of ATM cells and ATM cells belonging to a framework or transfer framework. In particular, in the case of ATM communications networks, loss priorities are assigned to transmitting ATM cells and based on the loss priorities and based on loss priorities decisions are made concerning the retransfer of the respective ATM cells in a communication system. In this connection a monitoring procedure is used to decide on the retransfer or rejection of an ATM cell to the respective communications system based on the assigned loss priorities. In this way assigning loss priorities to individual cells establishes which ATM cells can be discarded in the event of overload within an ATM communication system without the loss of real time information that is relevant to the connection.

Also, the "Traffic Management 4.1" proposal of the 1999 ATM Forum defines various traffic classes and connection types. These include constant bit rate (CBR) connections, variable bit rate (VBR) connections, available bit rate (ABR) connections, unspecified bit rate (UBR) connections and guaranteed frame rate (GFR) connections.

The constant bit rate connection type is used for virtual links, for which a given constant transmission bandwidth

must be provided for the time in which a virtual link exists.

The variable bit rate connection type is defined for virtual links with variable and/or changeable transmission rate requirements in the "Traffic Management 4.1" of the 1999 ATM Forum proposal.

The available bit rate connection type makes possible applications that do not have assigned a specific transmission bandwidth. The applications can use the currently possible transmission bandwidths within the ATM communication network, whereby the respective available bit rate connection must be assigned a maximum and a minimum transmission rate in each case and is not allowed to go above or fall below these limits.

The unspecified bit rate connection type is not assigned any fixed cell loss information or cell delay times of the respective virtual connection. Instead, the unspecified bit rate connection type represents a best effort service class comparable to the type of service class that in practice is provided for Internet applications.

The guaranteed frame rate connection type is provided to support delay-tolerant applications that are guaranteed a narrow transmission bandwidth and which can be granted additional transmission capacity freed up during data traffic. In a guaranteed frame rate connection type, a frame's information is packed into ATM cells and all ATM cells of a given frame are assigned the same loss priority or cell loss priority information using cell loss priority bits (CLP bits), i.e., the header of the

ATM cells assumes the same value of the CLP bit used to control overload in ATM communications systems as for the ATM cells of a frame of a virtual guaranteed frame rate connection.

If, for example, a network node or an ATM communications system are overloaded, it could result in all of the ATM cells belonging to the network node or an ATM communications system being discarded. Experts in the field know of a number of different anti-overload strategies, such as frame discard, see the 1999 ATM Forum "Traffic Management 4.1" proposal. The above can avoid that additional ATM cells of the frame are transmitted via the provided transmission after loss or reception of a faulty ATM cell, although the frame information would not be received error-free at the end of the transmission line. The above would result in an unnecessary load on the ATM communications system. That is why in the event of an overloaded transmission line it is especially important to remove the additional ATM cells of a frame as quickly and effectively as possible. If the ATM cells of a frame show different loss priorities, this frame will not support a quality of service, i.e., if an overload situation occurs some or all of the frame's ATM cells can be discarded in the network node or in the ATM communications system.

We also know ITU-T standards I.610 and I.371 provided solely for the operation, maintenance and administration and also resource management of ATM cells and control cells within the ATM communications system. Such ATM cells are called operation administration maintenance (OAM) cells and resource management cells, respectively. These can be inserted into the continuous ATM cell stream

by ATM communications transmitters and an ATM communications system. When inserting OAM cells or RM cells into the cell
stream, it is especially important to ensure the quality of service for the frames to be sent.

The underlying task of the invention is to ensure the quality of service when inserting operation administration maintenance cells and resource management cells. The task is accomplished by the features of Claim 1.

The essential aspect of the procedure according to the invention is as follows: in order to determine cell loss priority information in operation, maintenance, administration and/or resource management cells that are inserted between virtually linked cells with guaranteed frame rate within an ATM communications system and/or an ATM communications system, cell loss priority information of the cell to be sent directly of the relevant virtual connection is determined and inserted into the operation, maintenance, administration and/or resource management cell as current cell loss priority information. Consequently, all ATM cells, including the inserted operation, maintenance, administration and/or resource management cells, contain the same cell loss priority information and the quality of service is ensured for each frame in an advantageous manner and/or the discarding of a complete frame and/or single ATM cells of a frame due to the insertion of operation, maintenance, administration and/or resource management cells with different cell loss priority information is avoided. Using the procedure according to the invention, existing monitoring algorithms can be advantageously continue to

be used because as a rule the operation, maintenance, administration and/or resource management cells inserted into the cell stream for the overload control of a network node and/or an ATM communications system do not have to be treated differently.

According to an additional embodiment of the procedure according to the invention, the respective cells are assigned different loss priorities by the cell loss priority information -- Claim 2 -- and the cell loss priority information is created by a one-bit piece of information -- Claim 3. The allocation of different loss priorities using the cell loss priority information and creating a one bit piece of information is coordinated with the "Traffic Management 4.1" proposal of the 1999 ATM Forum.

According to another embodiment of the procedure according to the invention, the operation, maintenance, administration and/or resource management cells take the form of operation administration maintenance (OAM) cells and resource management (RM) cells according to standard ITU-T I.160 and ITU-T I.371 -- Claim 4.

An additional significant advantage of the procedure according to the invention consists in the fact that in the absence of a cell of the virtual connection to be transmitted directly, the virtual link inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell as current cell loss priority information -- Claim 5. On this point, advantageously, the standard cell loss priority information represented by the CLP bit assumes the logical value "0", i.e., that there is a low

probability - due to the standard "0" assigned to the CLP bits in the ATM cells - that these ATM cells will be discarded in the event of an overload situation, for example, within an ATM communications system.

According to another embodiment of the procedure according to the invention, after the transmission of the last cell of a frame in a virtual link during the insertion of an operation, maintenance, administration and/or resource management cell, the cell loss priority information of the cell to be sent directly in the following frame of the virtual link is determined and inserted into the operation, maintenance, administration and/or resource management cell as current cell loss priority information -- Claim 6. Advantageously, the operation, maintenance, administration and/or resource management cell inserted after the sending of the last cell will be transmitted together with the cells of the following frame.

The procedure according to the invention is explained below using a block diagram.

The Figure 1 block diagram is a schematic representation of an ATM communications system ATM-KE using an asynchronous transfer mode, in which a majority of feeder lines E1 through En and a majority of customer lines A1 through An are connected using service units AE. Of the above, for example, feeder lines E1 through En and customer lines A1 through An and one of several possible service units AE are represented. Via the feeder lines E1 through En and customer lines A1 through An, ATM cells DPx are transmitted via virtual links using asynchronous transfer mode, whereby variable, fixed or guaranteed

transfer rates are provided for the transmittal of the ATM cells DPx via the virtual links. In the block diagram, a virtual GFR connection GFR-Vx is represented by a broken line and its feeder line Ex and/or its customer line Ax. In a guaranteed frame rate (GFR) link all of a frame's information is packed in ATM cells and all ATM cells DPx of a frame are assigned the same loss priority and/or cell loss priority information CLP using cell loss priority bits (CLP-Bit).

The service unit AE contains a number of processing devices BHE, whereby each of the feeder lines E1 through En and the customer lines A1 through An is assigned to a processing device BHE.

To illustrate the procedure according to the invention, Figure 1 shows, for example, the feeder-processing device BHEE assigned to the virtual GFR link GFR-Vx, which is connected to the feeder network Ex. The ATM cells DPx sent in the virtual GFR link GFR-Vx are transmitted to the feeder-processing device BHEE of service unit AE. Then the ATM cells DPx of the virtual GFR link GFR-Vx are sent to the switching network KA of the ATM communications system ATM-KE, whereby a multi-level structure of interconnected switching matrices KV is shown in Figure 1, as an example, for switching network KA. However, other single- or multi-stage switching networks can be provided. Then the ATM cells DPx of the virtual GFR link GFR-Vx is relayed by switching network KA to the customer line AX by a processing device BHE connected to the customer lines A1 through An.

The processing devices BHE/BHEE are supplied with a storage unit PS and a micro controller MC, whereby, for

example, the storage unit PS and the microcontroller MC of the feeder processing device BHEE of the virtual GFR link GFR-Vx is represented in Figure 1. When an ATM cell DPx of a frame of the virtual GFR link GFR-Vx arrives at the ATM communications system ATM-KE, the ATM cell DPx is forwarded to the feeder processing device BHEE of the service unit AE where it is temporarily stored in storage unit PS. Figure 1 shows an example of a first and second ATM cell DP1, DP2 of the virtual GFR link GFR-Vx temporarily stored in the storage unit PS, whereby the first ATM cell DP1 was temporarily stored in the storage unit PS and is therefore provided for direct transmission to the switching network KA. If the insertion of an OAM or RM cell OAM into the cell stream of the virtual GFR link GFR-Vx is provided by the ATM communications system ATM-KE, it is assumed that there is one OAM and/or RM cell OAM in the ATM communications system ATM-KE and/or in the feeder-processing device BHEE of the service unit AE. Further, the cell loss priority information CLP transmitted in the temporarily stored first ATM cell DP1 from the next ATM cell DPX to be sent to the virtual GFR link GFR-Vx is read and/or copied using the microcontroller MC as part of a reading cycle and inserted into the created OAM and/or RM cell OAM and temporarily stored in the storage unit PS. Figure 1 shows an example of an OAM cell AOM in which using the microcontroller MC, the cell loss priority information CLP of the temporarily stored first ATM cell DP1 is entered and/or copied. The modified OAM and/or RM cell OAM is then inserted in the cell stream of the virtual GFR link GFR-Vx, for example, as shown in Figure 1, between the first and second, temporarily stored ATM cell DP1, DP2. If there is no ATM cell DP1, DP2 of the GFR link GFR-Vx temporarily stored in the storage unit and/or

if the last ATM cell DP1,DP2 of the frame of the virtual GFR link GFR-Vx was already sent, the OAM and/or RM cell OAM to be inserted will be given the logical value "0" standard cell loss priority information and inserted and/or copied. After transmitting the first ATM cell DP1, the inserted OAM cell OAM will be sent to the network KA and switched.

The respective ATM cell DPx and/or the inserted OAM and/or RM cell OAM will be sent to the processing device BHE connected to the consumer line Ax and forwarded to the consumer line Ax by the processing device BHE.

Claims

1. Procedure to determine cell lost priority information (CLP) in operation administration maintenance (OAM) cells and resource management cells that are inserted between cells (DP1, DP2) of a virtual link (GFR-Vx) with guaranteed frame rate within an ATM communications system and/or ATM communications terminal equipment,

in which the cell lost priority information (CLP) of the cell (DP1) to be transmitted directly of the respective virtual link (GFR-Vx) is determined and inserted into the operation administration maintenance and/or resource management cells (OAM) as current cell lost priority information (CLP).

2. Procedure according to Claim 1 wherein the cell lost priority information (CLP) of the respective cell (DPx) can be assigned different loss priorities.

3. Procedure according to Claim 1 or 2 wherein the cell lost priority information (CLP) comprises a one- bit piece of information.

4. Procedure according to one of Claims 1 through 3 wherein the operation administration maintenance and resource management cells (OAM) are structured as operation administration maintenance and resource management cells according to standard ITU-T I.610 and ITU-T I.371.

5. Procedure according to one of Claims 1 through 4 wherein that in the absence of a cell to be transmitted

directly (DP1), the virtual link (GFR-Vx) inserts a given standard cell loss priority information into the operation, maintenance, administration and/or resource management cell (OAM) as current cell loss priority information (CLP).

6. Procedure according to one of Claims 1 through 5 wherein after the transmission of the last cell (DPx) of a frame in a virtual link during the insertion of an operation, maintenance, administration and/or resource management cell (OAM), the cell loss priority information (CLP) of the cell to be transmitted directly in the following frame of the virtual link (GFR-Vx) is determined and inserted into the operation, maintenance, administration and/or resource management cell (OAM as current cell loss priority information (CLP).

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

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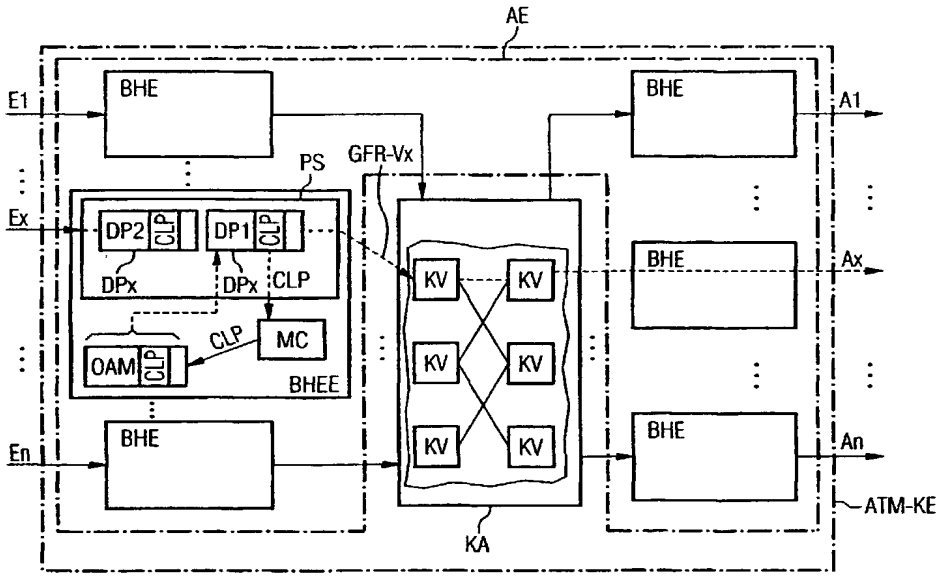
— *Mit internationalem Recherchenbericht.*
— *Vor Ablauf der für Änderungen der Anspruche geltenden Frist; Veröffentlichung wird wiederholt, falls Änderungen eintreffen.*

[Fortsetzung auf der nachsten Seite]

(54) Title: METHOD OF DETERMINING CELL LOSS PRIORITY INFORMATION

(54) Bezeichnung: VERFAHREN ZUM BESTIMMEN VON ZELLENVERLUSTPRIORITÄTSINFORMATIONEN



(57) Abstract: In an ATM communication system or communication terminal the cell loss priority information (CLP) in operation, maintenance, administration and resource-management cells (OAM) that are inserted between cells (DP1, DP2) of a virtual connection (GFR-Vx) with a guaranteed frame rate, is detected by determining the cell loss priority information (CLP) of the cell (DP1) of the respective virtual connection (GFR-Vx) which is actually to be transmitted and by inserting said information in the operation, maintenance, administration and resource-management cells (OAM).

[Fortsetzung auf der nächsten Seite]

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Declaration and Power of Attorney For Patent Application
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration

Als nachstehend benannter Erfinder erklare ich hiermit an Eides Statt

As a below named inventor, I hereby declare that

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehorigkeit den im Nachstehenden nach meinem Namen aufgefuhrten Angaben entsprechen,

My residence, post office address and citizenship are as stated below next to my name,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprunglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, fur den dieser Antrag gestellt wird und fur den ein Patent beantragt wird für die Erfindung mit dem Titel:

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Verfahren zum Bestimmen von Zellenverlustprioritätsinformationen

Method of determining cell loss priority information

deren Beschreibung

the specification of which

(zutreffendes ankreuzen)
☐ hier beigefügt ist
☒ am 31 07 2000 als
PCT internationale Anmeldung
PCT Anmeldungsnummer PCT/DE00/02521
eingereicht wurde und am _____
abgeändert wurde (falls tatsachlich abgeändert).

(check one)
☐ is attached hereto
☒ was filed on 31 07 2000 as
PCT international application
PCT Application No PCT/DE00/02521
and was amended on _____
(if applicable)

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeandert wurde

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1 56(a)

Ich beanspruche hiermit ausländische Prioritätsvorteile gemass Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed

German Language Declaration

Prior foreign appplications Prioritat beansprucht			Priority Claimed
19935787.0 (Number) (Nummer)	DE (Country) (Land)	29.07.1999 (Day Month Year Filed) (Tag Monat Jahr eingereicht)	☒ Yes / Ja ☐ No / Nein
19937244.6 (Number) (Nummer)	DE (Country) (Land)	06.08.1999 (Day Month Year Filed) (Tag Monat Jahr eingereicht)	☒ Yes / Ja ☐ No / Nein
(Number) (Nummer)	(Country) (Land)	(Day Month Year Filed) (Tag Monat Jahr eingereicht)	☐ Yes / Ja ☐ No / Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind

I hereby claim the benefit under Title 35 United States Code. §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occured between the filing date of the prior application and the national or PCT international filing date of this application.

PCT/DE00/02521 (Application Serial No) (Anmeldeseriennummer)	31.07.2000 (Filing Date D, M, Y) (Anmeldedatum T, M, J)	anhangig (Status) (patentiert, anhängig, aufgegeben)	pending (Status) (patented, pending, abandoned)
_____ (Application Serial No.) (Anmeldeseriennummer)	(Filing Date D,M,Y) (Anmeldedatum T, M, J)	_____ (Status) (patentiert, anhangig, aufgeben)	(Status) (patented, pending, abandoned)

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German Language Declaration

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